

SECTION 15181

STEAM AND CONDENSATE PIPING

LANL MASTER CONSTRUCTION SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the LEM Mechanical POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within “stars” during editing.

Coordinate this specification with Mechanical Standard Drawing ST6200 through ST6204 and Civil Standard Drawing ST3950. Refer to Specification 02554 for site steam and condensate piping system.

Specification developed for ML-3 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Building steam and condensate service piping, fittings, valves, etc. downstream of the first steam shutoff valve inside building.

1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
 - 1. Catalog data on pipe, pipe fittings, and valves.
 - 2. Certification of welders.

1.3 QUALITY ASSURANCE

- A. Comply with ASME B31.9, Building Services Piping.

PART 2 PRODUCTS

Piping, fittings, and materials described herein are generally restricted to a maximum 150 psig working steam pressure (WSP). For other pressure and temperature ratings, additional specification and restrictions may be required.

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

2.2 STEAM PIPING, ABOVE GRADE (150 PSIG MAXIMUM)

- A. Pipe: Black steel, Schedule 40, ASTM A53, ERW, Grade B, or A106, Grade B (welded pipe).
- B. Pipe: Black steel, Schedule 80, ASTM A53, ERW, Grade B, or A106, Grade B (threaded pipe).
- C. Fittings (threaded): Malleable iron, ASME B16.3, Class 150 for pressures of 15 psig or less, Class 300 for pressures above 15 psig. NOTE: Eccentric threaded fittings are not available in malleable iron. Use steel butt welded eccentric fittings or threaded carbon steel, ASTM A234, reducing eccentric swage nipples, Grinnell Co.
- D. Fittings (socket weld): Forged steel, ASTM A105, Class 3000.
- E. Fittings (butt weld): Steel, ASTM A234, Grade B, Schedule 40 or 80 (to match piping).
- F. Joints: Threaded for pipe sizes up to 2 inches, welded or flanged for pipe sizes above 2 inches.

2.3 CONDENSATE PIPING, ABOVE GRADE (150 PSIG MAXIMUM)

- A. Pipe: Black steel, Schedule 80, ASTM A53, ERW, Grade B, or A106, Grade B.
- B. Fittings (threaded): Malleable iron, ASME B16.3, Class 150 for pressures of 15 psig or less, Class 300 for pressures above 15 psig. NOTE: Eccentric threaded fittings are not available in malleable iron. Use steel butt welded eccentric fittings or threaded carbon steel, ASTM A234, reducing eccentric swage nipples, Grinnell Co.
- C. Fittings (socket weld): Forged steel, ASTM A105, Class 3000.
- D. Fittings (butt weld): Steel ASTM A234, Grade B, Schedule 80.
- E. Joints: Threaded for pipe sizes up to 2 inches, welded or flanged for pipe sizes above 2 inches

2.4 FLANGES, FOR PIPE SIZES OVER 2 INCHES

- A. Forged steel, ASTM A105, Grade 1, ANSI Class 150, weld neck, raised face, dimensions per ANSI B16.5.

2.5 GASKET MATERIAL

- A. Pressures above 100 psig: Flexitallic, non-asbestos, CG style

- B. Pressures 100 psig or less: Sheet gasket, branded material, 1/16 inch thick, non-asbestos, suitable for steam service up to 500 degrees F. Klinger, No. C4401.

2.6 BOLTS, STUDS AND NUTS

- A. Bolts/Studs: Alloy steel, ASTM A193, Grade B7.
- B. Nuts: Alloy steel, ASTM A194, Grade 2H.

2.7 STEEL GATE VALVES (THREADED ENDS)

- A. Manufacturer: Vogt, Series 12111.
- B. Forged steel, ASTM A105, Grade 2, Class 800, steam service, 500 degrees F at 1595 psig, rising stem, threaded ends, hard faced seat and disc.

2.8 STEEL GATE VALVES (FLANGED OR WELDED ENDS)

- A. Manufacturer: Powell, Figure 1503N.
- B. Cast carbon steel, ASTM A216, Grade WCB, Class 150, steam service, 500 degrees F at 170 psig, rising stem, flanged or welded ends to suit piping, hard-faced seat and disc.

2.9 STEEL GLOBE VALVES (THREADED ENDS)

- A. Manufacturer: Vogt, Series 12141.
- B. Forged steel, ASTM A105, Grade 2, Class 800, steam service, 500 degrees F at 195 psig, rising stem, threaded ends, hard-faced seat and disc.

2.10 STEEL GLOBE VALVES (FLANGED OR WELDED ENDS)

- A. Manufacturer: Powell, Figure 1531.
- B. Cast carbon steel, ASTM A216, Grade WCB, Class 150, steam service, 500 degrees F at 170 psig, rising stem, flanged or welded ends to suit piping, hard-faced seat and disc.

2.11 BRONZE GATE VALVES (THREADED ENDS)

- A. Manufacturer: Nibco, T-113.
- B. Bronze, ASTM B62, Class 125, steam service, 350 degrees F at 125 psig, screw-in bonnet, rising stem, solid wedge, threaded ends.

2.12 BRONZE GLOBE VALVES (THREADED ENDS)

- A. Manufacturer: Nibco, T211.

- B. Bronze, ASTM B62, Class 125, steam service, 350 degrees F at 125 psig, screw-in bonnet, integral seat, renewable seat and disc, threaded ends.

2.13 BRONZE CHECK VALVES (THREADED ENDS)

- A. Manufacturer: Nibco, T143.
- B. Bronze, ASTM B62, Class 125, steam service, 350 degrees F at 125 psig, horizontal swing.

2.14 STEEL CHECK VALVES (THREADED ENDS)

- A. Manufacturer: Vogt, No. 574.
- B. Forged steel, ASTM A105, steam service, 350 degrees F at 125 psig, horizontal swing.

2.15 STRAINERS

- A. Pressures 15 psig or less: "Y" Type, rated for 125 psig steam, service to 350 degrees F, 20 mesh stainless steel screens, bronze body, ASTM B61 with blowoff gate valve and plug.
- B. Pressures above 15 psig: "Y" Type, rated for 250 psig steam, 20 mesh stainless steel screens, steel body, ASTM A216 with blowoff gate valve and plug.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside of piping before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Whenever work is suspended during construction, protect open ends with temporary plugs or caps.
- E. After completion, fill, clean, and chemically treat systems. Refer to Section 15185, Chemical Water Treatment.

3.2 INSTALLATION

- A. Install in accordance with manufacturers' instructions.
- B. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and not interfere with use of space.

- D. Sleeve and caulk pipes penetrating exterior walls or interior bearing walls. Provide waterproof installation for exterior walls. Provide UL/FM approved through-penetration firestop system when penetrating fire-rated barriers (i.e., walls, floors, etc).
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance for installation of insulation and access to valves and fittings.
- G. Provide safe access or remote operators where valves and fittings are not exposed or installed over 7 feet in height above finished floor.
- H. Slope steam and condensate piping 1 inch in 40 feet (0.25 percent) in direction of flow.
- I. Install valves with stems upright or horizontal, not inverted.
- J. Use threaded bronze valves and strainers in piping up to 2 inches, for design pressures 15 psig or less.
- K. Use threaded steel valves and strainers in piping up to 2 inches, for design pressures above 15 psig.
- L. Use welded or flanged steel valves and strainers in piping above 2 inches.
- M. Provide eccentric reducers, flat on bottom, in horizontal runs of steam and condensate piping.
- N. Provide globe valves for throttling, bypass, or manual flow control services.
- O. Provide gate valves inside building to isolate equipment or part of piping system.
- P. Connect steam and condensate branch lines into top of main or at a 45-degree angle from top of main.
- Q. Label Piping in accordance with Section 15075.
- R. Pressure test piping in accordance with Section 15992.
- S. Support piping in accordance with Section 15060.
- T. Insulate piping in accordance with Section 15080.

END OF SECTION